



U.S. ARMY RESEARCH, DEVELOPMENT AND ENGINEERING COMMAND

USER-CENTRIC SYSTEMS ENGINEERING

Integrating User Experience Design with Traditional Systems Engineering

Radhika J Patel

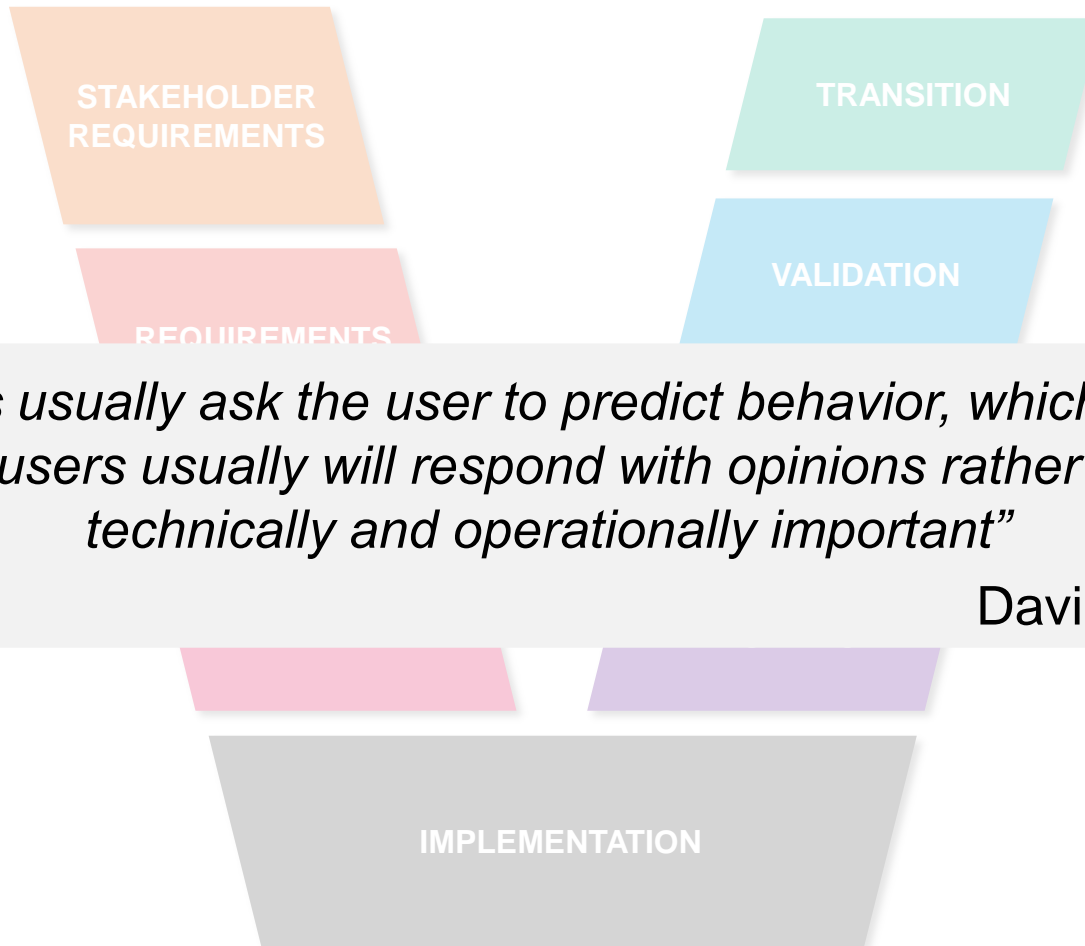
Systems Engineer

Armaments Research, Development, and Engineering Center



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TRADITIONAL SYSTEMS ENGINEERING



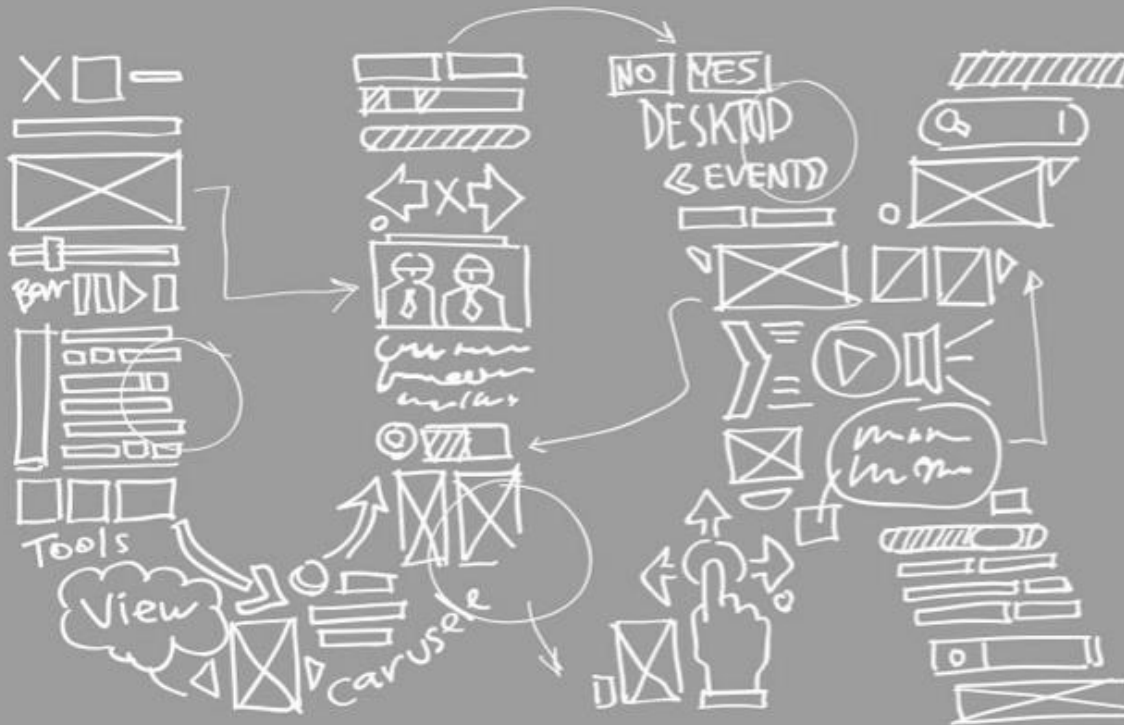
“...engineers usually ask the user to predict behavior, which is difficult to do, and so users usually will respond with opinions rather than what’s technically and operationally important”

David Travis



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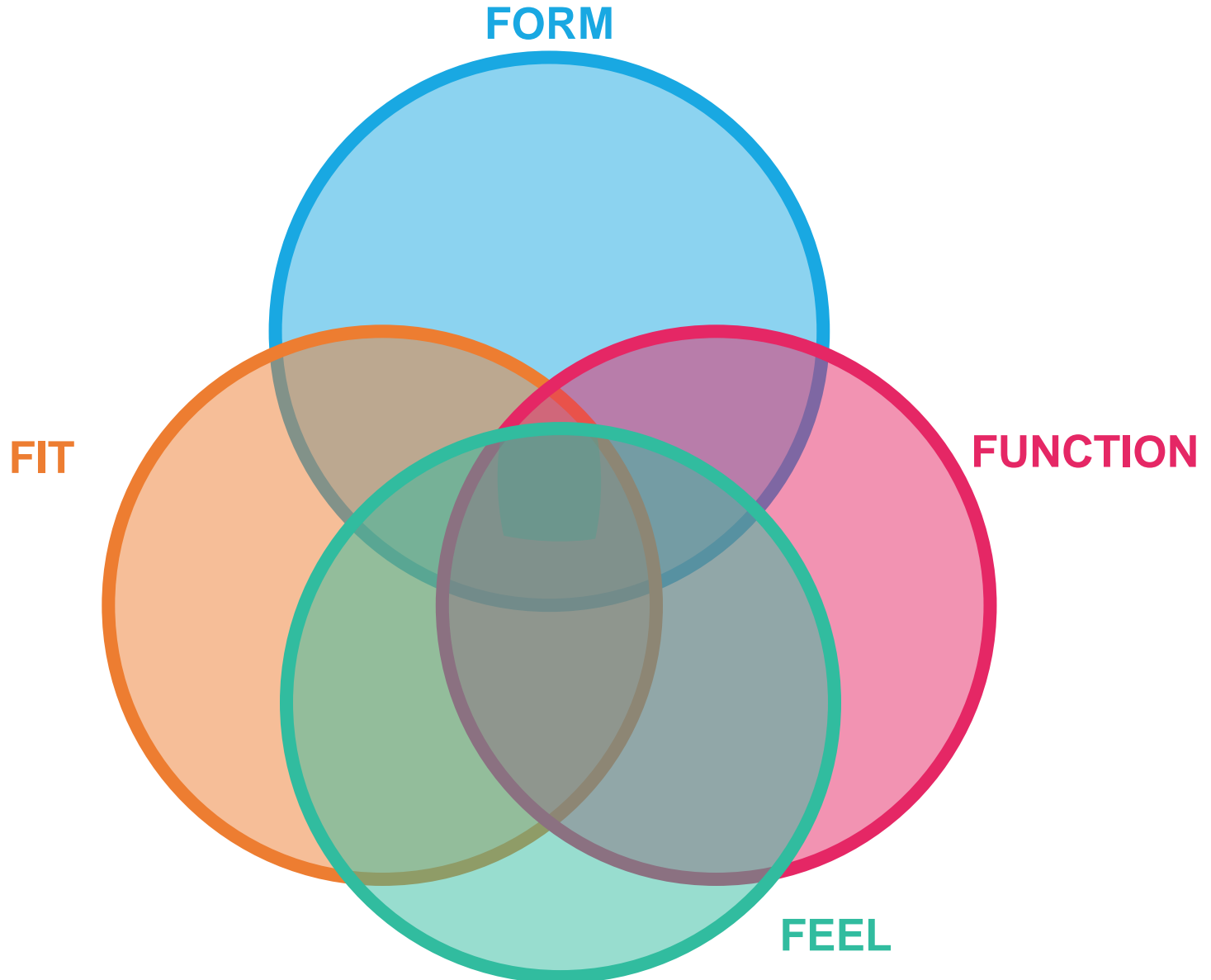
USER EXPERIENCE DESIGN



UX Design is the discipline that focuses on enhancing user satisfaction with a product by improving the usability, accessibility, and pleasure provided in the interaction with the product.



USER EXPERIENCE DESIGN





WHY UX DESIGN?



An engineer and a user's idea of 'functional' is very different.



WHY UX DESIGN?



Technical performance is undercut by poor user experience in operating the system.



WHY UX DESIGN?



System usability contributes to user confidence just as much as system performance.



WHY UX DESIGN?



Intuitive systems are safer systems.



WHY UX DESIGN?



Necessity is the mother of invention.



WHY UX DESIGN?



**Necessity is the mother of
~~invention~~ repurposed
government furnished
equipment.**



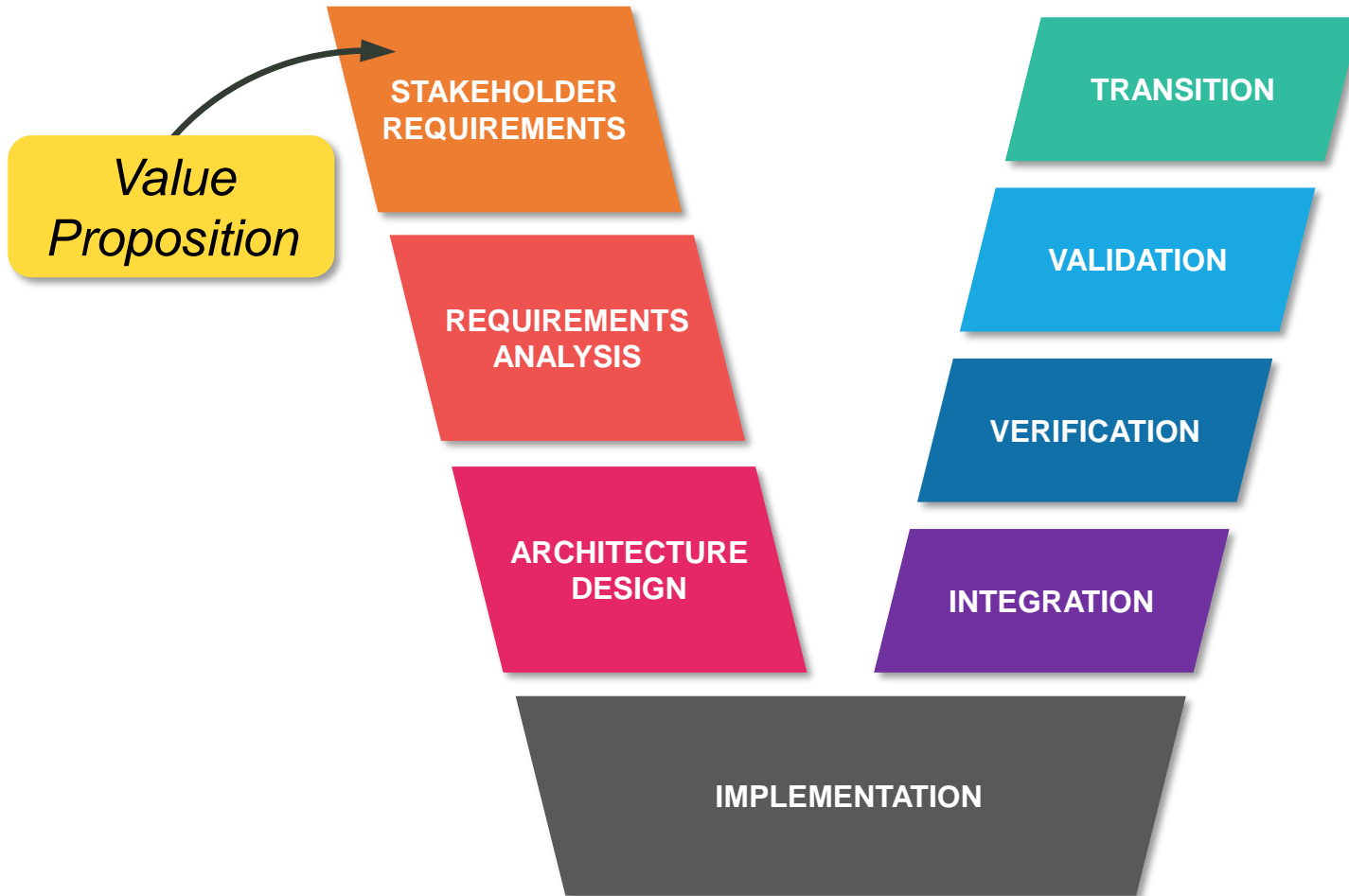
WHY UX DESIGN?



The future warfighter will be accustomed to elegant UX Design seen in consumer products.



UX DESIGN TOOLS

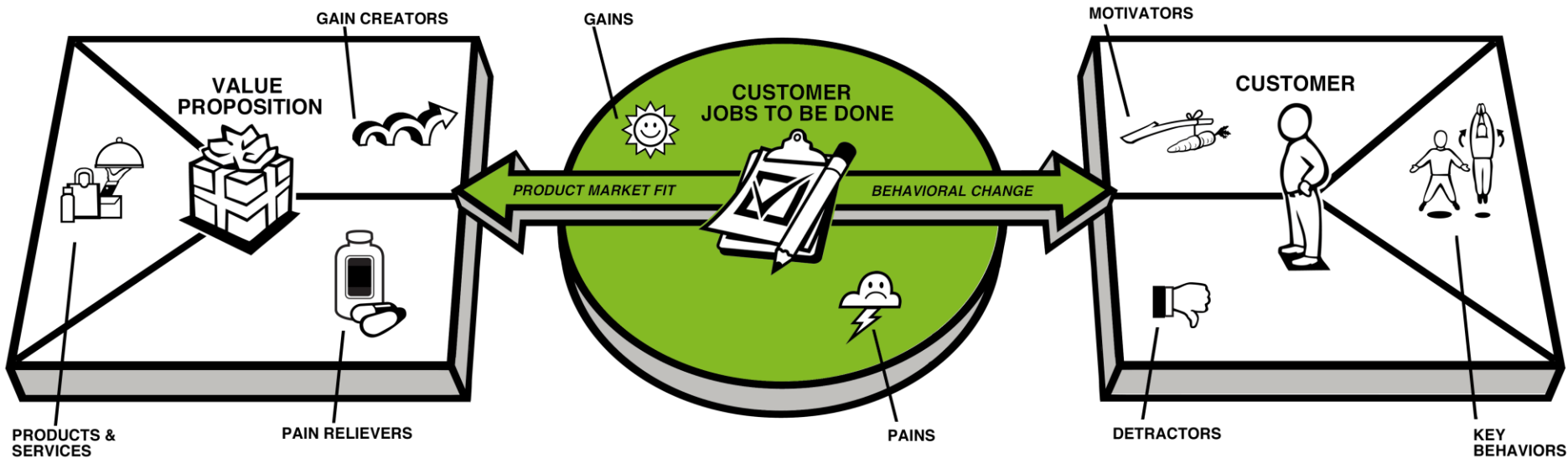




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VALUE PROPOSITION

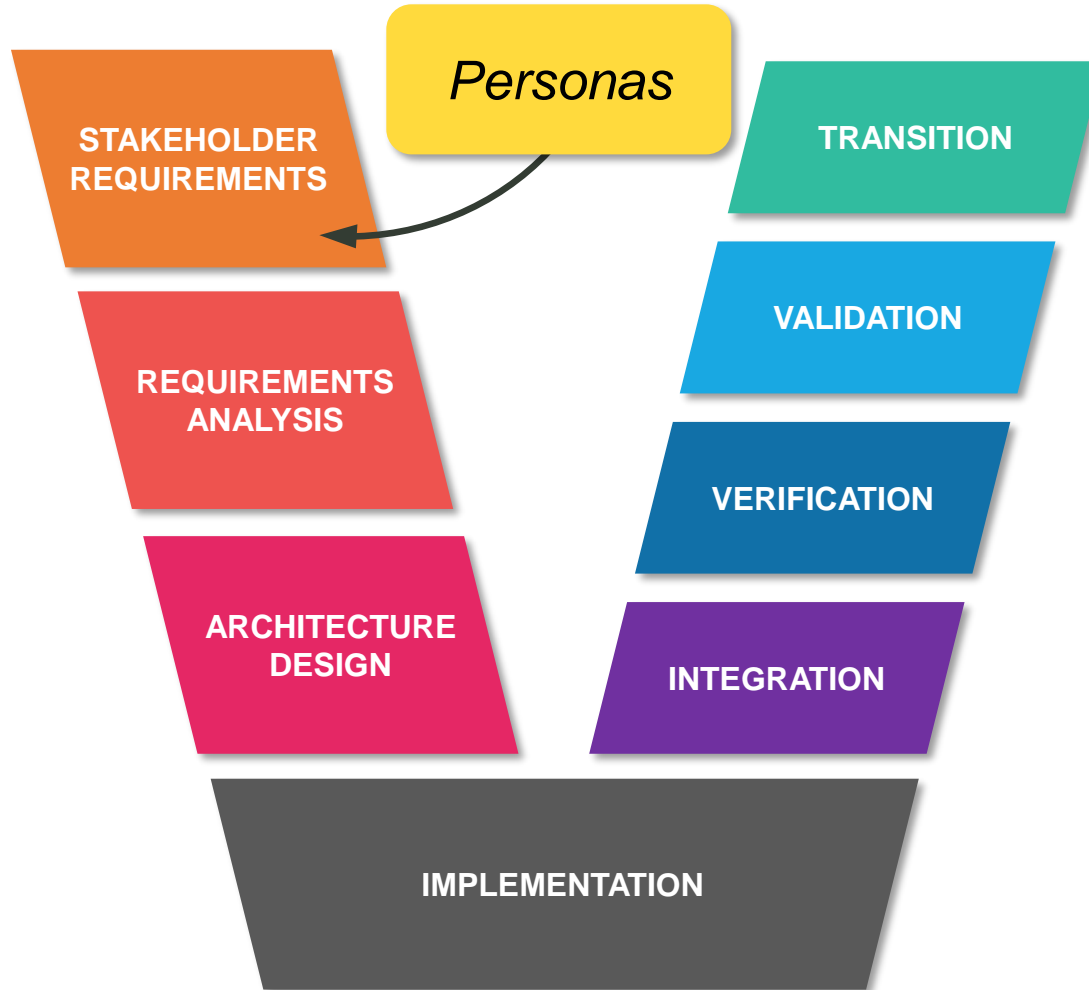
A value proposition is a description of the value the system will deliver to the customer, and the canvas helps break down what the need is and what the system should be, where it will be used, and who it is being designed to serve.



imaginego.com



UX DESIGN TOOLS





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PERSONAS

A persona is a representation of a user that incorporates the user's goals, needs, and interests and is best based on actual research and observation of users.

Clark Andrews

AGE 26

OCCUPATION Software Developer

STATUS Single

LOCATION San Jose, CA

TIER Experiment Hacker

ARCHETYPE The Computer Nerd

Friendly
Clever
Go-Getter

Motivations

Incentive

Fear

Achievement

Growth

Power

Social

Personality

Extrovert Introvert

Sensing Intuition

Thinking Feeling

Judging Perceiving

Goals

- To cut down on unhealthy eating and drinking habits
- To measure multiple aspects of life more scientifically
- To set goals and see and make positive impacts on his life

Frustrations

- Unfamiliar with wearable technology
- Saturated tracking market
- Manual tracking is too time consuming

Bio

Aaron is a systems software developer, a "data junkie" and for the past couple years, has been very interested in tracking aspects of his health and performance. Aaron wants to track his mood, happiness, sleep quality and how his eating and exercise habits affects his well being. Although he only drinks occasionally with friends on the weekend, he would like to cut down on alcohol intake.

Technology

IT & Internet

Software

Mobile Apps

Social Networks

Brands

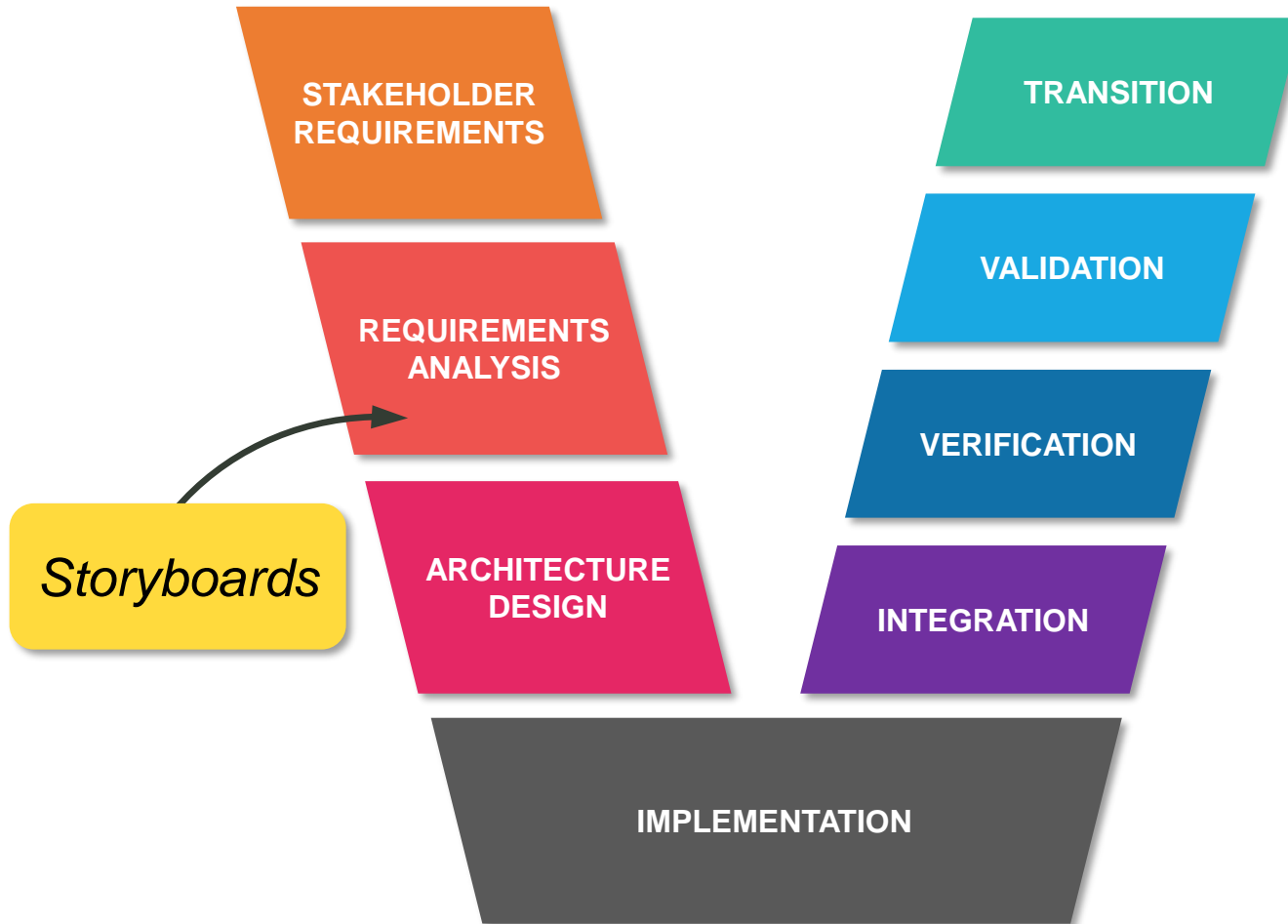
+

"I feel like there's a smarter way for me to transition into a healthier lifestyle."

xtensio.com



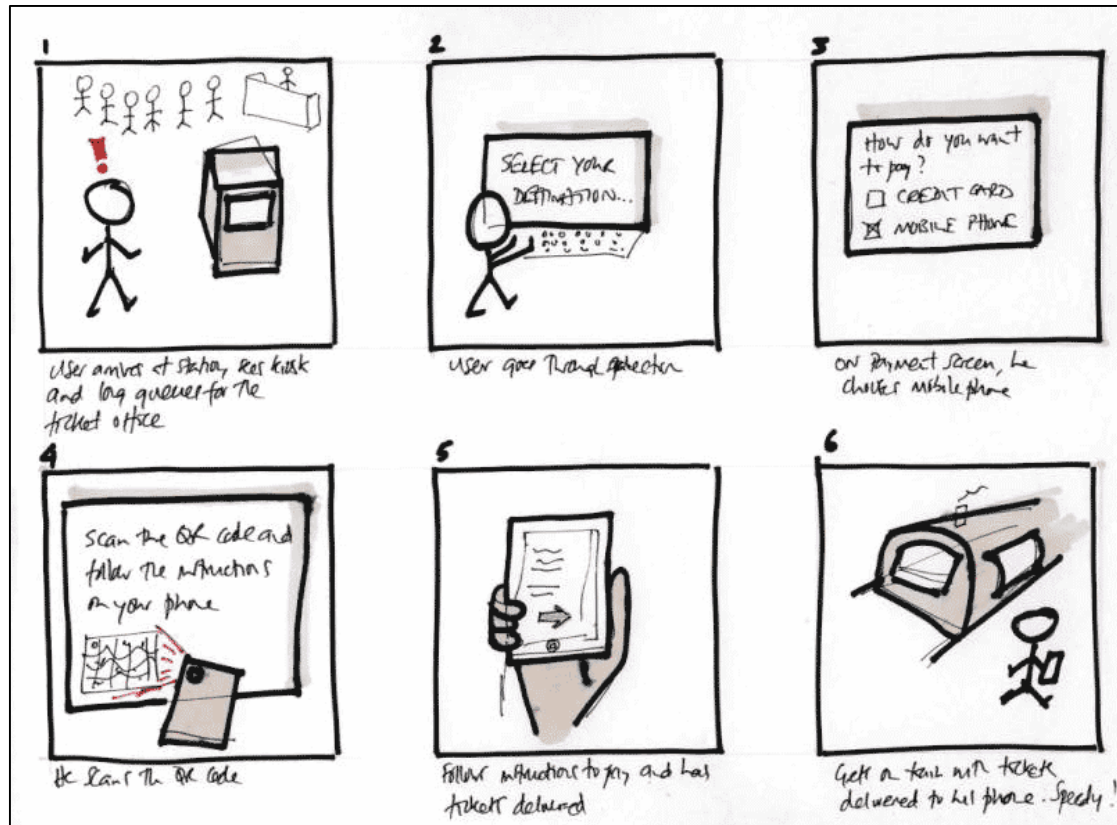
UX DESIGN TOOLS





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STORYBOARD

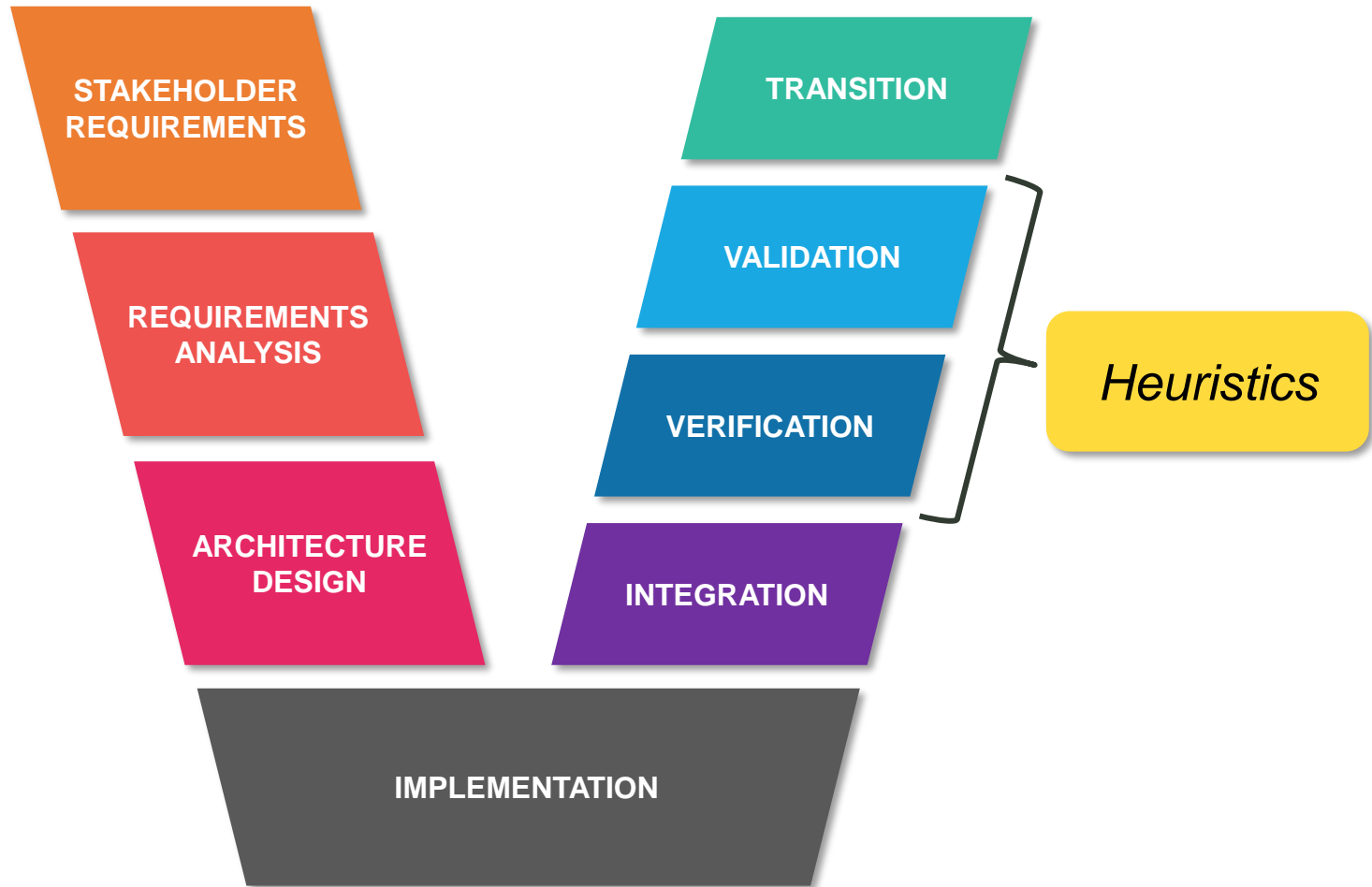


pinterest.co.uk

A storyboard is a visual tool to explore a user's interaction and experience with a product, which often looks like a comic strip for how a person would use a product in the intended environment and how he/she might feel or react throughout the process.



UX DESIGN TOOLS

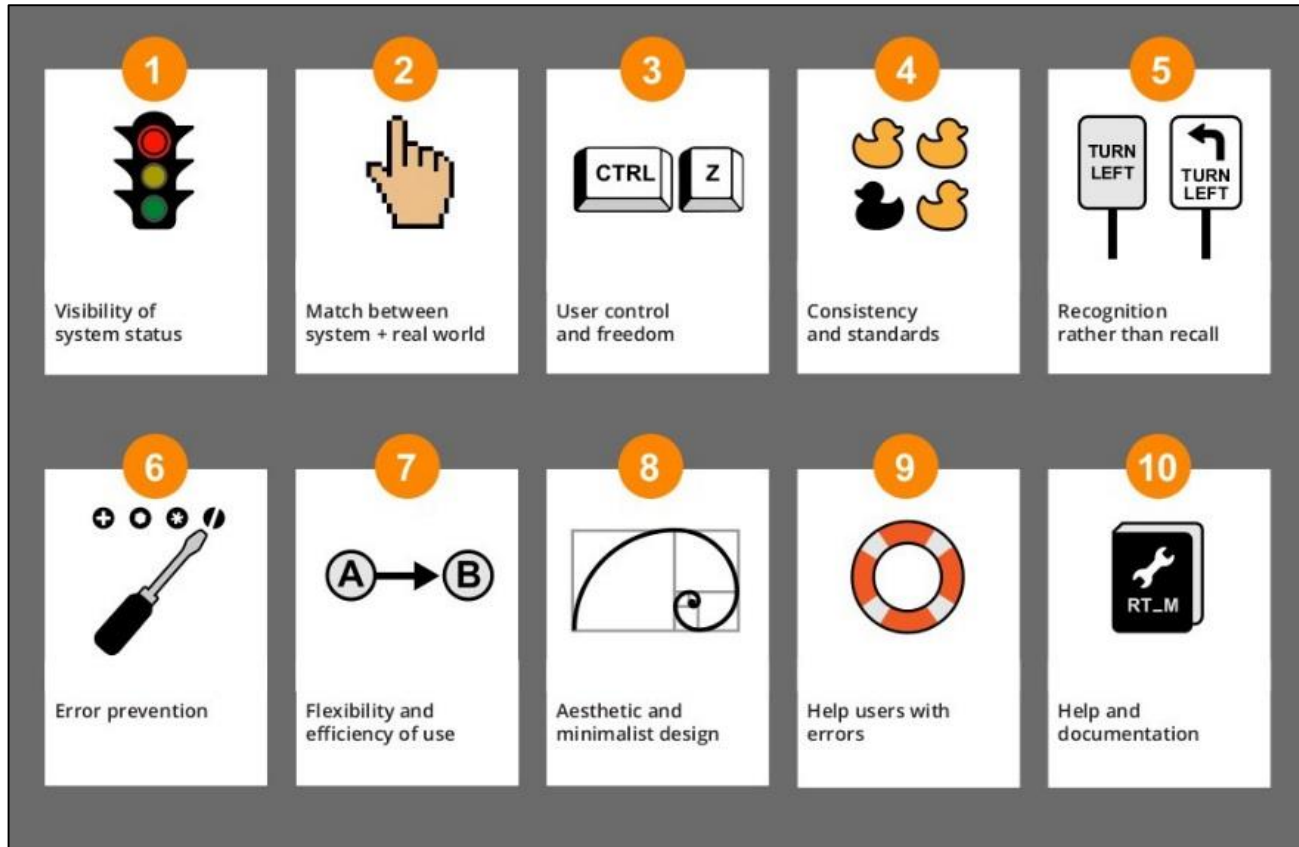




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HEURISTIC ANALYSIS

Heuristic Analysis is an evaluation of how 'user-friendly' a product is and it is usually conducted by usability subject matter experts.



Nielsen, 1994a



CHALLENGES

UX Design Toolset is geared towards Software-Intensive Products

The Government lacks a burning platform

Systems Engineers would need to play the UX Designer Role

If you think good design is expensive, **you should look at the cost of bad design.**
Ralf Speth



THANK YOU | QUESTIONS?

Contact Information



radhika.j.patel2.civ@mail.mil
rpat5490@gmail.com



973-724-1568



<https://www.linkedin.com/in/radhika-patel-25388173/>



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